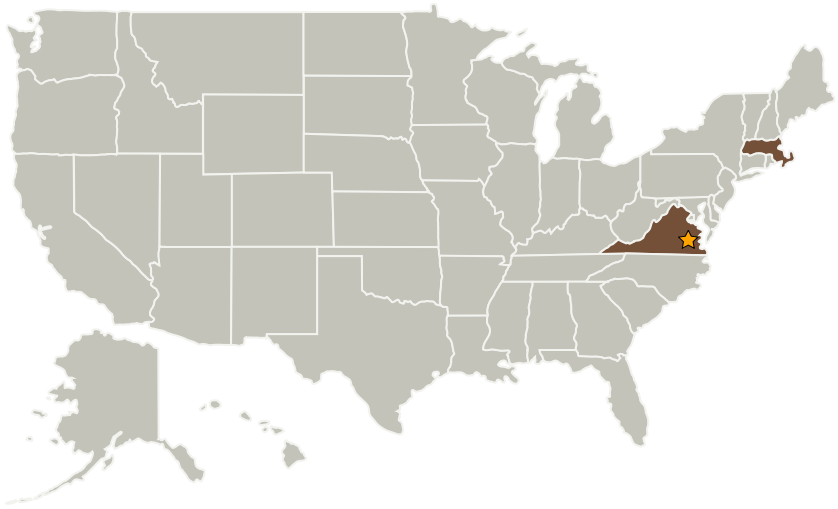
Crew Cerebral Oxygen Monitor, Phase I

Completed Technology Project (2004 - 2004)

Project Introduction

This Phase I SBIR proposal is aimed at developing a non-invasive, optical method for monitoring the state of consciousness of crew members in operational environments. Utilizing differences in wavelength-dependent optical absorption between oxygenated and deoxygenated blood, pulsed laser diodes of selected wavelengths and symmetrically-placed photodetectors will be used to monitor the scattered light signals. Changes between these light signals and those established by prior baseline measurements will be monitored and interpreted using appropriate algorithms. Continuous monitoring of the mental state of personnel engaged in critical activities could provide a means of protection against human performance lapses resulting from unforeseen circumstances. Operational crew members are often subject to stress, increasing the possibility of operator mistakes or oversight. If a deterioration of the state of consciousness of an individual can be detected before that individual?s performance is affected, serious accidents or lapses in operator performance could be avoided. Phase I will establish feasibility, and Phase II will produce and evaluate a prototype monitoring instrument.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
Spire Corporation	Supporting Organization	Industry	Bedford, Massachusetts

Primary U.S. Work Locations	
Massachusetts	Virginia

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Kurt J Linden

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.3 Human Health and Performance
    - TX06.3.3 Behavioral Health and Performance